

NOTICE:

If your project scope includes HOME ENERGY RATING SYSTEM (HERS) measures, CF1R documents will need to be completed through a HERS Provider's registry.

CF1R documents are to demonstrate the project design and equipment are compliant with the Energy Code at time of permit application.

Split Systems and Packaged Systems

	 Mandatory Requirements						 Prescriptive Requirements		
Change This (and nothing else)	Equipment Efficiency §110.1 §110.2(a)	Thermostat §110.2(c) §150.0(i) §150.2(b)1F Setback Thermostat or EMCS	Cooling & Heating Loads §150.0(h) §150.2(a) exception 4-5	HERS Verified Duct Leakage ² §150.2(b)1	Air Filter §§150.0(m)12-13 §§150.2(b)1C-D	HERS Verified Airflow Rate ³ §150.0(m)13 §150.2(b)1C-F	HERS Verified Fan Efficacy §150.0(m)13 §150.2(b)1	Duct Insulation §150.2(b)1D R-8 for CZ 11, 14-16 R-6 for CZ 1-10, 12-13	HERS Verified Refrigerant §150.1(c)7 §150.2(b)1F In CZ 2, 8-15
Replace belts, blower wheel fan and/or electrical components	no	no	no	no	no	no	no	no	no
Tap into existing HVAC and add ≤40 ft new ducting	no	no	YES to verify existing HVAC meets heating load if for an addition	YES if ducting in garage	no	no	no	YES	no
Tap into existing HVAC and add >40 ft new ducting	no	no	YES to verify existing HVAC meets heating load if for an addition	YES	no	no	no	YES	no
Replace all the ducting for existing HVAC	no	no	no	YES	YES	YES	YES	YES	no
Replace air handling unit and furnace	YES	no	no	YES	no	no	no	no	no
Replace any refrigerant containing system components ⁴	no	YES	no	YES ⁵	no	Yes if HERS Refrigerant Charge required	no	no	YES
Replace a room heating / AC unit	YES	no ¹	no	no	no	no	no	no	no
Replace all HVAC equipment but no new ductwork	YES	YES	no	YES	no	YES if HERS Refrigerant Charge required	no	no	YES if AC
Add/Replace HVAC equipment and ≥75% of ducting	YES	YES	YES	YES	YES	YES if AC	YES if AC	YES	YES if AC

- Replacing the blower wheel fan is considered a repair and does NOT trigger the Energy Code.
- All new HVAC equipment must meet minimum federal efficiency requirements
- Cooling line insulation is triggered if the line set (cooling system, suction line) is replaced or repaired. Line sets ≤ 1.5" in diameter must have 0.75" thick insulation.

NOTES

- 1 Setback thermostats not required for gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves, room air conditioners and room air-conditioner heat pumps.
- 2 New multifamily duct system leakage must be $\leq 12\%$ in total, or $\leq 6\%$ to the outside; new single family $\leq 5\%$ leakage. Or, if unable to meet the sealing requirements, all accessible leaks must be sealed and verified by a HERS Rater. HERS duct testing is not required when asbestos is present. New or replacement space-conditioning ducts, air-handling units, cooling or heating coils, or plenums located in a garage space must be $\leq 6\%$, or be sealed and verified by a HERS Rater.
- 3 Applicable to new forced air ducted systems with cooling and altered system in which refrigerate charge is required. Completely new systems (equipment and ducting) can use return grille option per [Table 150.0-B or C](#), or verified per HERS verification of airflow: 0.45 W/CFM for gas furnace air-handling units (manufactured as of July 3, 2019) and 0.58 W/CFM for air-handling units that are not gas furnaces (i.e., heat pumps).
- 4 Refrigerant-containing system components such as the compressor, condensing coil, evaporator coil, refrigerant metering device or refrigerant piping.
- 5 Duct leakage testing for refrigerant containing systems only applies to the installation or replacement of an air handler, outdoor condensing unit of a split-system air conditioner or heat pump, or cooling or heating coil.

HVAC System Considerations

Equipment Type: §150.1(c)6 Electric resistance heating is not allowed to be added to a home without a performance calculation showing it will work, but can be used for altered heating equipment if already present. Heat pump equipment can always replace gas or electric resistance heating equipment without the need for a performance calculation.

§§110.1/110.2(a) All HVAC equipment must be certified through [Title 20 Appliance Efficiency Standards](#) and meet minimum efficiency requirements.

Controls Required: §110.2(b) Heat pump equipment to use controls so that supplementary electric resistance strip heating is secondary to the heat pump operation.

§110.2(d) Furnaces $\geq 225,000$ BTUH, including electric furnaces, that are not located within the conditioned space shall have jacket losses not exceeding 0.75% of the input rating. They must also have an intermittent ignition or interrupted device (IID), and have either power venting or a flue damper. A combustion air intake vent damper is an acceptable alternative to a flue damper for furnaces where combustion air is drawn from the conditioned space. A setback thermostat or an Energy Management Control System (EMCS) must be programmed to provide, at a minimum, functionality required of a setback thermostat.

Condensers (AC): §150.0(h)3 Must be located a min. 5' clearance from dryer vent outlet.

Refrigerant: §150.0(j) Refrigerant pipe insulation & protection is required of all new piping.

§150.2(b)Fiib. When HERS refrigerant charge verification is required prescriptively, a demand responsive HVAC control (Wi-Fi thermostat that can be accessed remotely) may be required if outdoor temperatures are less than 55°F. This should be confirmed with HERS rater.

§150.1(c)7A Exception allows for packaged systems for which the manufacturer has verified correct system refrigerant charge prior to shipment from the factory to be exempt from HERS verification of refrigerant charge.

Air Filters: §§150.0(m)12, 150.2(b)1C and 150.2(b)1Diia Air filters to be 2" MERV-13 when an entirely new or complete replacement HVAC system (equipment and ducts) has >10 ft of ducting. This also applies to complete duct replacements. Alternative filter options may apply.

Duct Insulation: §150.0(m) New ducting min. Performance method allows R-4.2 when the duct system is entirely inside conditioned space and confirmed by a HERS rater. Portions of the duct that are completely exposed to and surrounded by directly conditioned space are not required to be insulated.

§150.2(b)1D Prescriptive requirements require new ducting min. insulation in unconditioned spaces of R-8 in Climate Zones (CZ) 11, 14-16 and R-6 in CZ 1-10, 12-13.

Ventilation Mandatory Requirements Based on ASHRAE 62.2

Change This (and nothing else)	HERS Verified Whole Building IAQ §150.0(o) §150.2(a)2C	Air Filters §150.0(m)12	Kitchen Local Exhaust §150.0(o)	Bathroom Local Exhaust §150.0(o)	Clothes Dryer Local Exhaust §150.0(o)	HERS Verified Kitchen Hood §150.0(o)
Remodeling bathroom	no	no	no	YES	no	no
Remodeling kitchen and adding kitchen hood	no	no	YES	no	no	YES
Adding dwelling unit to existing home (i.e., ADU)	YES	YES	YES	YES	If applicable	If applicable
Addition to home $>1,000$ ft ²	YES	YES	If applicable	If applicable	If applicable	If applicable
Addition to home $\leq 1,000$ ft ²	no	no	If applicable	If applicable	If applicable	If applicable

For More Information

Primary Sources

- Energy Code Section 110.2 – Mandatory Requirements for Space-Conditioning Equipment
energycodeace.com/site/custom/public/reference-ace-2019/Documents/subchapter2alloccupanciesmandatoryrequirementsforthemanufacturec.htm
- Energy Code Section 150.0 – Mandatory Features and Devices
energycodeace.com/site/custom/public/reference-ace-2019/Documents/subchapter7lowriseresidentialbuildingsmandatoryfeaturesanddevicec.htm
- Energy Code Section 150.1 – Performance and Prescriptive Compliance Approaches for Newly Constructed Residential Buildings
energycodeace.com/site/custom/public/reference-ace-2019/Documents/subchapter8lowriseresidentialbuildingsperformanceandprescriptivec.htm
- Energy Code Section 150.2 – Energy Efficiency Standards for Additions and Alterations in Existing Buildings that Will Be Low-Rise Residential Occupancies
energycodeace.com/site/custom/public/reference-ace-2019/Documents/subchapter9lowriseresidentialbuildingsadditionsandalterationstoc.htm
- Energy Code Residential Compliance Manual, Chapter 4.6 – HVAC Building Requirements, Indoor Air Quality and Mechanical Ventilation
energycodeace.com/site/custom/public/reference-ace-2019/Documents/46indoorairqualityandmechanicalventilationc.htm

California Energy Commission Information & Services

- Energy Code Hotline: 1-800-772-3300 (Free) or Title24@energy.ca.gov
- Online Resource Center:
www.energy.ca.gov/programs-and-topics/programs/buildingenergy-efficiency-standards/online-resource-center
 - The Energy Commission’s main web portal for the Energy Code, including information, documents and historical information

Additional Resources

- Energy Code Ace:
EnergyCodeAce.com
 - An online “one-stop-shop” providing free resources and training to help appliance and building industry professionals decode and comply with Title 24, Part 6 and Title 20. The site is administered by California’s investor-owned utilities.

Of special interest: Fact Sheet

energycodeace.com/content/resources-fact-sheets

- Residential HVAC Alterations 2019

Please register with the site and select an industry role for your profile in order to receive messages about all our free offerings!



This program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E®), Southern California Edison Company (SCE), and Southern California Gas Company (SoCalGas®) under the auspices of the California Public Utilities Commission.

© 2019 PG&E, SDG&E, SoCalGas and SCE. All rights reserved, except that this document may be used, copied, and distributed without modification. Neither PG&E, SoCalGas, SDG&E, nor SCE — nor any of their employees makes any warranty, express or implied; or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any data, information, method, product, policy or process disclosed in this document; or represents that its use will not infringe any privately-owned rights including, but not limited to patents, trademarks or copyrights. Images used in this document are intended for illustrative purposes only. Any reference or appearance herein to any specific commercial products, processes or services by trade name, trademark, manufacturer or otherwise does not constitute or imply its endorsement, recommendation or favoring.